ABSTRACT OF THE DISCLOSURE

Macroporous ceramics were produced using the droplets of an emulsion as the templates around which the ceramic is deposited through a sol-gel process. Subsequent aging, drying and calcination yields a ceramic with pores in the range of 0.1 to several micrometers which have been left behind by the droplets. The unique deformability of the droplets prevents cracking and pulverization during processing and allows one to obtain porosities in excess of 74%. By starting with a monodisperse emulsion (produced through a repeated fractionation procedure) pores with a uniform and controllable size have been obtained. Self-assembly of these droplets into a colloidal crystal leads to ceramics which contain ordered arrays of pores. A wide range of porosities is obtainable with the advantages of low-temperature sol-gel processing, with a high degree of control and low cost.